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AMENDMENT TO THE CLAIMS

We claim:

1. (CURRENTLY AMENDED) A process for producing hydrogen gas comprising the step of reacting an organic substance with a base and water to form said hydrogen gas, wherein said organic substance includes four or more carbon atoms per molecule, and wherein said process is controlled by the reaction of said organic substance with the base.

2. (ORIGINAL) The process of claim 1, wherein said organic substance is a hydrocarbon.

3. (ORIGINAL) The process of claim 1, wherein said organic substance is an oxygenated hydrocarbon.

4. (ORIGINAL) The process of claim 1, wherein said organic substance is a branched compound.

5. (ORIGINAL) The process of claim 1, wherein said organic substance is a cyclic compound.

6. (ORIGINAL) The process of claim 1, wherein said organic substance is an aromatic compound.

7. (ORIGINAL) The process of claim 1, wherein said organic substance is a component of gasoline.

8. (ORIGINAL) The process of claim 1, wherein said organic substance is a component of diesel or bio-diesel.

9. (ORIGINAL) The process of claim 1, wherein said organic substance is a component of petroleum.

10. (ORIGINAL) The process of claim 1, wherein said organic substance is pentane, hexane, heptane, octane or dodecane.

11. (ORIGINAL) The process of claim 9, wherein said aromatic organic substance is benzene or a substituted benzene compound.

12. (ORIGINAL) The process of claim 1, wherein said organic substance is an alkene or an alkyne.

13. (ORIGINAL) The process of claim 1, wherein said organic substance includes five or more carbon atoms per molecule.

14. (ORIGINAL) The process of claim 1, wherein said organic substance includes six or more carbon atoms per molecule.

15. (ORIGINAL) The process of claim 1, wherein said base comprises a hydroxide compound.

16. (ORIGINAL) The process of claim 15, wherein said hydroxide compound is a metal hydroxide compound.

17. (ORIGINAL) The process of claim 16, wherein said metal hydroxide compound is an alkali metal hydroxide compound.

18. (ORIGINAL) The process of claim 1, wherein said base is in a solid or molten state.

19. (ORIGINAL) The process of claim 1, wherein said water is in the form of steam.

20. (ORIGINAL) The process of claim 1, wherein said organic substance is in the gas phase.

21. (ORIGINAL) The process of claim 1, wherein said reaction further forms carbonate ion.

22. (ORIGINAL) The process of claim 21, wherein said carbonate ion is

formed in the form of a metal carbonate compound.

23. (ORIGINAL) The process of claim 22, further including the step of reacting said metal carbonate compound with a metal hydroxide compound.

24. (ORIGINAL) The process of claim 22, wherein said metal carbonate compound is formed as a precipitate.

25. (ORIGINAL) The process of claim 24, further including the step of thermally decomposing said metal carbonate precipitate, said thermal decomposition step producing a metal oxide.

26. (ORIGINAL) The process of claim 1, wherein said reaction further forms bicarbonate ion.

27. (ORIGINAL) The process of claim 1, wherein said reaction occurs in the liquid phase.

28. (ORIGINAL) The process of claim 1, wherein said reaction is an electrochemical reaction.

29. (ORIGINAL) The process of claim 1, wherein said reaction occurs at a pressure greater than ambient pressure.

30. (ORIGINAL) The process of claim 1, wherein said reaction occurs at a pressure greater than 10 bar.

31. (ORIGINAL) The process of claim 1, wherein said reaction occurs at a pressure greater than 25 bar.

32. (ORIGINAL) The process of claim 1, wherein the minimum temperature at which said reaction is spontaneous is less than the minimum temperature at which the conventional reformation reaction of said organic substance is spontaneous, said conventional reformation reaction of said organic substance being a reaction of said organic substance with water or steam to form hydrogen gas and carbon dioxide.

33. (ORIGINAL) The process of claim 1, wherein the rate of production of hydrogen gas from said reaction of said organic substance at a desired temperature above the minimum temperature at which said reaction is spontaneous is greater than the rate of production of hydrogen gas from the conventional reformation reaction of said organic substance at said desired temperature, said conventional reformation reaction of said organic substance being a reaction of said organic substance with water or steam to form hydrogen gas and carbon dioxide.

34. (ORIGINAL) The process of claim 1, further comprising the step of reacting one or more additional organic substances with said base and said water to form said hydrogen gas.

35. (ORIGINAL) A process for producing hydrogen gas comprising the step of reacting a mixture of organic substances with a base and water to form said hydrogen gas, said mixture including two or more organic substances.

36. (ORIGINAL) The process of claim 35, wherein said mixture of organic substances includes two or more hydrocarbons.

37. (ORIGINAL) The process of claim 35, wherein said mixture of organic substances includes two or more oxygenated hydrocarbons.

38. (ORIGINAL) The process of claim 35, wherein said mixture of organic substances includes a hydrocarbon and an oxygenated hydrocarbon.

39. (ORIGINAL) The process of claim 35, wherein said mixture of organic substances is a petroleum distillate.

40. (ORIGINAL) The process of claim 35, wherein said mixture of organic substances is gasoline or a distillate thereof, diesel or a distillate thereof, or kerosene or a distillate thereof.

41. (WITHDRAWN) A process for producing hydrogen gas comprising the step of reacting a hydrocarbon with water and a base in the liquid phase to form said hydrogen gas, wherein said reaction occurs at a pressure of at least 10 bar.

42. (WITHDRAWN) The process of claim 41, wherein said reaction occurs at a pressure of at least 25 bar.

43. (WITHDRAWN) A process for producing hydrogen gas comprising the step of reacting an organic substance with a solid phase base and water to form said hydrogen gas.